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Market Engineering Research for the U.S Prepaid Wireline Calling Card Services Market 1996-2006

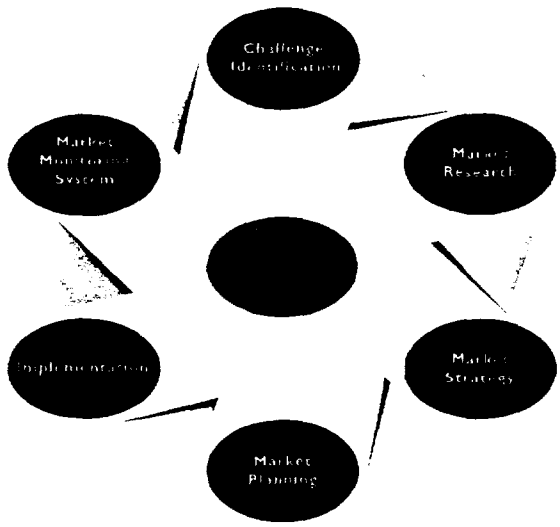
Introducing the Market Engineering Consulting Report

Overview

Frost & Sullivan's Market Engineering Consulting Report takes a unique approach to market research. It is based on the Market Engineering system—a market measurement system based on engineering principles, designed to lead to market success for the companies that use it. Chart 1 illustrates the Market Engineering system.

Chart 1

The Market Engineering System



Source: Frost & Sullivan

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Market Engineering Research Methodology

Research Scope

Objectives and Purpose

The objective of this report is to evaluate the current state of the U.S wireline card calling services market and forecast future revenues, product pricing, and unit sales. The report also identifies the key challenges facing the industry and strategies to succeed in light of such obstacles. For each product segment reviewed, market drivers as well as market restraints are evaluated.

This report forecasts the U.S wireline card calling services market for the period 1996 through 2006, with 1999 as the base year.

Report Structure and Market Segmentation

The structure of the report is as follows:

- Chapter 1 provides an overview of the total U.S wireline card calling services market.
- Chapter 2 details the methodology used to gather information. It also includes a list of definitions and acronyms.
- Chapter 3 summarizes the challenges facing the U.S wireline card calling services market.
- Chapter 4 provides the Market Engineering analysis for the total market.
- Chapters 5 and 6 provide a detailed forecast and analysis of each segment:
  - Chapter 5: U.S wireline post-paid card calling services
  - Chapter 6: U.S wireline prepaid card calling services
- Chapter 7 details the Market Engineering strategic recommendations based on Frost & Sullivan's analysis.

- Chapter 8 provides an overview of the Market Engineering planning.
- Chapter 9 provides an overview of the implementation of Market Engineering.
- Chapter 10 provides an overview of Market Engineering monitoring.
- Chapter 11 presents the Frost & Sullivan Market Engineering awards for the U.S wireline card calling services market.
- Chapter 12 is the database of key industry participants.
- Chapter 13 provides a supplement on the Market Engineering system.

RESEARCH METHODOLOGY

Frost & Sullivan's 12 Step Methodology

Frost & Sullivan employs a rigorous and comprehensive 12-step methodology in its market research. Frost & Sullivan has refined its methodology over many years of experience, having researched a wide diversity of markets in many different life cycles—from embryonic to mature. Frost & Sullivan's reference publication, *Industrial Market Engineering* (Publication 5168-80), explains the research methodology in great depth. That same methodology is the one presented here, called the 12-Step Frost & Sullivan Market Engineering Research Methodology.

Frost & Sullivan's Market Engineering system:

- Focuses on challenges, problems, and needs of industry participants
- Is based on primary market research, not secondary or previously published research
- Is based on detailed, comprehensive "bottom-up" data collection techniques
- Is based on measurements

Step 1: Define Market Problems, Needs, and Opportunities

PHASE ONE: ANALYSIS

The first phase in this step of the research process is to establish why this subject deserves an extensive market research report. During this stage, the research team analyzes the market to identify past problems faced by industry participants competing in the market, the key challenges they confront now, and the opportunities that may arise.

Frost & Sullivan gathers its information from various sources. The data represent mainly primary information gained from interviews with industry competitors. Frost & Sullivan encourages its customers to specify what they seek in a research report. To create the overall research strategy and structure of the project, Frost & Sullivan uses this information in combination with feedback from its sales force, its consultants, and its research directors.

Phase Two: Kickoff Meeting

The kickoff meeting is a valuable element of the process. It allows the entire industry unit to play a role in the research process. At this meeting, all staff members involved in the industry discuss the research topic in great detail. This meeting greatly improves Frost & Sullivan's depth of insight into the needs, problems, and challenges of the industry.

Step 2: Define Objectives and Goals of the Research Project

The second step is to define the research objectives toward meeting the challenges, problems, and needs identified in Step 1. The objectives of Step 2 are to:

- Determine market research measurements
- Choose segmentation
- Select research instrumentation
- Identify key issues and trends in the market
- Designate key customer groups
- Single out competitors

Step 3: Design Optimal Research Team

Research projects demand close participation among many key people, all of whom contribute to a project's final value. Participants typically involved in the research project include the lead research analyst, the support research analyst, research directors, account executives, Market Engineering consultants, key customers, industry advisers, and research editors.

Lead Research Analyst

The lead research analyst has primary responsibility for designing and implementing the research project. The lead analyst defines the project scope, identifies key research issues, ensures compliance with Frost & Sullivan's Market Engineering methodology, and has ultimate responsibility for the quality, accuracy, and completeness of the research.

Support Research Analyst

The support research analyst works closely with the lead research analyst to assist in data collection and analysis. This collaboration greatly augments the report's strategic insight.

Research Directors

Research directors manage all research projects in a given industry segment. Their role is to ensure consistency among research projects and to assist the analyst team when needed. They are also responsible for assembling an industry research team whose skills and knowledge include the entire industry. The research director is highly experienced in all facets of the industry and the research process and plays a valuable role in the structuring and analysis of each project.

Account Executives

Account executives verify that all feedback and inputs from the customer are fully integrated in the research team's findings. Account executives solicit customers for feedback generated by previous research reports as well as for their needs in future research. When the research is complete and the research report issued, Frost & Sullivan account executives also facilitate communication and feedback between customers and analysts.

Market Engineering Consultants

Market Engineering consultants work with clients on their unique marketing and business problems. This ongoing relationship with key clients allows the clients to play a valuable advisory role in many market research projects. Market Engineering consultants also work closely with clients in choosing larger-scale research projects stemming from questions and issues stimulated by the research publication. Typical projects are acquisition searches, new product investigation, and strategic planning to augment market share.

Key Customers

Many of Frost & Sullivan's larger client companies participate in the research process by consulting on segmentation strategies, analysis, and research design. Frost & Sullivan greatly encourages this relationship with clients. It improves the customer-focused orientation of products.

Industry Advisers

In some cases, Frost & Sullivan employs key industry advisers and consultants to design the research project, to better reflect the nuances of the specific subject.

Step 4: Launch Data Collection Phase

During this step, the analyst team designs the data collection process and implements the secondary research phase. The tasks involved in this work are to:

- Review all secondary research data based on:
  - Frost & Sullivan research database
  - Frost & Sullivan corporate library
  - Frost & Sullivan customer database
  - Frost & Sullivan competitor database
  - Online databases
  - University library affiliations
- Create filing systems
- Structure research tables, figures, and charts
- Develop in-depth table of contents
- Develop customer database
- Develop competitor database

Step 5: Select Interview Strategy and Design of Survey

The strategy used to conduct effective interviews during customer surveys is critical to the success of every research project. In Step 5, Frost & Sullivan analysts receive extensive training in interview designs, techniques, and strategies.

Frost & Sullivan often employs end-user surveys to identify competitive threats and trends in the market. The company takes great care in designing surveys that will optimize customer response and minimize the bias surveys can introduce to market research. (Frost & Sullivan's *Customer Engineering* [Publication 5338-80] provides a much fuller description of the company's survey design strategy and procedure for end-user surveys.)

Step 6: Test the Survey Design

Before Frost & Sullivan puts interview strategies and surveys into use across the entire market, it tests them for efficacy and accuracy. The analyst team corrects all design problems before attempting any interviews.

Participants in customer surveys and competitive interviews review each survey instrument to ensure that the survey:

- Uses readily understandable terminology
- Takes all measurements in the same format
- Asks all questions in the right order
- Can yield the desired information
- Stimulates respondents to cooperate

Step 7: Conduct Primary Market Research

The primary market research is the heart of every Frost & Sullivan study. Step 7 is to obtain primary data directly from industry participants. Its finely honed interviewing skills enable the analyst team to elicit valuable strategic information from market participants. Using Frost & Sullivan's uniquely designed research techniques, its analysts are able to obtain masses of information invaluable for identifying trends, threats, and opportunities in the marketplace.

Cross-Verification of Data

Cross-verifying the information received is an important part of this step. Frost & Sullivan analysts are trained to listen for misleading or incorrect information, to detect when a respondent may be purposefully providing incorrect information or is merely guessing. Erroneous information thus almost always reveals itself during the cross-verification stage of the Market Engineering process.

If possible, Frost & Sullivan cross-verifies all data from each respondent by interviewing others in the same industry. Furthermore, answers are confirmed by speaking to other competitors, end users, and customers. Finally, the results are corroborated using other market research measurements. The analyst team discards any misleading information that does not integrate with the entire market analysis.

Bottom-Up Approach

Frost & Sullivan prides itself on its use of a so-called bottom-up Market Engineering methodology. In a bottom-up method of market measurement, each final market measurement represents the sum of many detailed, bottom-rung measurements.

Frost & Sullivan calculates market forecasts and market sizes by interviewing each industry competitor and deriving each company's annual shipments to—or revenues from—the defined market. To calculate the total market size, measure its growth rate, and make market

forecasts, the analyst team first cross-verifies all measurements, then adds them to derive the final measurement of the total market.

Bottom-Up Versus Top-Down Approach

The top-down approach is to ask a few industry participants to estimate the total size of the market, assess its growth rate, and make a forecast. These numbers are then averaged to make a final projection. This methodology is commonly used but is highly imprecise and can lead to serious problems when used to make strategic decisions.

The top-down approach assumes that the average industry participant has a solid perception of market measurements of an entire market segment or industry. Frost & Sullivan has found that it is often not so. Rarely found is the spokesperson that can accurately portray the actions of its own companies, let alone gauge the entire market segment or industry. It may be easy enough to describe a house across the street, but less easy to describe one on the next block. That is why Frost & Sullivan has chosen a "closer-to-home" approach—the bottom-up approach to market measurement.

Measuring Revenue Growth Rate

Frost & Sullivan uses an 11-year period to characterize a market. To illustrate both historic and future changes in the market over that period, all forecasts measuring revenue growth apply a compound annual growth rate (CAGR) calculation. Unlike the average annual growth rate (AAGR) method, the CAGR method takes into account the changes from year to year, not only in revenues, but also in revenue growth rate. The compound annual growth rate, therefore, is the rate at which the amount in the final year represents the future value of the amount in the first year after a specific interval.

In its interviews with market participants, Frost & Sullivan first makes sure that participants thoroughly understand and agree on how to define product segments. Frost & Sullivan's industry analysts exercise care that these terms coincide with those of most industry spokespersons.

For consistency and accuracy, Frost & Sullivan reports always calculate future revenues using current-year U.S. dollar values. This approach ensures that each revenue forecast reflects the dollar's true purchasing power in each of those specific years. This methodology also allows for the impact of inflation on growth rates, since inflation is the only thing that affects the dollar's purchasing power. Frost & Sullivan uses U.S. government data to calculate inflation rates.

Step 8: Research Analysis: Finding "Point A"

Once all the information has been collected, the analyst team explores the most important question of any market research project: Where is the market right now? In other words, where is "Point A"?

Companies cannot possibly navigate the marketplace until they have obtained this market "fix." Without it, business planning and strategic decision support are not possible.

Point A can typically be determined using several key measurements, such as:

- Market share
- Historic market growth rate
- Market size
- Market segmentation
- Pricing
- Competitive activities
- Number of competitors
- Customer base measurements
- Market maturity

Step 9: Market Forecasting: Finding "Point B"

Once Point A is accurately identified, the next step is to identify the future position in the market (Point B). This measurement can be difficult to take, because many market trends and technical trends need to be surveyed over time to refine the accuracy of the forecast.

Most market research firms provide forecasts that cite only the measurement of market sizes at some future time. In contrast, Frost & Sullivan's forecasts include:

- Market trends
- Technical trends
- Regulatory trends
- Market maturity measurements
- Market share movements

The forecast also includes many other measurements, which when taken over time can help support a market forecast or analysis of a certain marketing scenario. Frost & Sullivan

analyzes the primary market drivers for each market segment before constructing a total market forecast.

Expert-Opinion Consensus Model

To improve the quality, accuracy, and depth of its forecasts, Frost & Sullivan uses the expert-opinion consensus forecasting model of market measurement. The company begins by analyzing all the data collected in the previous steps. From this analysis as well as from many measurements of change over time, an indication of the market's pattern and direction emerges.

Frost & Sullivan then discusses these data with market experts, including key customers, government regulators, sales managers, marketing managers, R&D managers, business development managers, management consultants, market research consultants, trade press journalists, company presidents, and others. After reviewing the data, these experts often provide significant strategic insights into the direction and velocity of the market.

In its more than 35 years of market research experience, Frost & Sullivan has found the expert-opinion consensus forecasting methodology to be the most reliable system of forecasting when combined with other elements of the Market Engineering methodology.

Because of the many uncontrollable variables in the marketplace, the accuracy of any forecast is almost impossible to guarantee. What *can* and *must* be determined with some accuracy, to enable companies to plan accordingly, are the direction of the market and its approximate speed. Frost & Sullivan finds the expert-opinion consensus forecasting model to be the most reliable forecasting tool for this in today's market.

Forecasting models based solely on statistics often do not adequately describe the high-technology markets on which Frost & Sullivan reports. The statistical data underlying these approaches often cannot be found, or the markets that are the subject of the forecast are simply moving too fast. Moreover, many statistical forecasting models do not adequately incorporate the wide variety of market drivers denoting most markets.

Step 10: Develop Strategic Recommendations

At this stage, Frost & Sullivan's analyst team has learned in broad terms why some companies are gaining and some are losing market share in a given market. The analyst team's next step is to prepare its strategic recommendations—perhaps the most intricate and important element of the entire research methodology.

These strategic recommendations allow readers to take corrective strategic action; so Frost & Sullivan's customers stand to benefit perhaps more from them than from any other single feature of Frost & Sullivan reports. Tailoring specific action plans to fit each company is not

possible, but the analyst team enumerates guidelines that any company can use to be a winner in a given market.

Who Is Winning, Who Is Losing, and Why?

Studying the gain and loss of market share yields a telling measurement of strategy. It is important to identify both the companies that are winning and the ones that are losing market share, and then determine the cause.

Market share is difficult to gain, so answers to this simple question provide indications of tremendous value for companies to use when navigating their own course. The contemporaneous actions of winning competitors should shape their own strategies.

Step 11: Confirm Results with Quality Control

In its drive to continuously upgrade its products, Frost & Sullivan uses three procedures:

- Quality control
- Verification
- Refinement

These procedures help guarantee superior, accurate market data for Frost & Sullivan clients.

Research Director's Final Review

Once market research work is concluded, the analyst team and a senior research director review and distill the results. The goal is to verify that all issues are covered, that the conclusions and analysis are logical, that all measurements have been included, and that the report is as accurate, comprehensive, and as detailed as possible, given the timetable for the research. The analyst team then adds any approved changes and additional information to the report.

Final Client Preparation

At this stage in the quality-control procedure, the Final Client Preparation (FCP) team checks several important elements of the report for accuracy and completeness.

Step 12: Market Monitoring and Customer Feedback Review

Market Monitoring

The market monitoring stage includes two critical elements, in which the analyst team:

- Solicits customer feedback to upgrade the report
- Continues market research in the industry

Customer Feedback and Review

Frost & Sullivan regards dialogue with customers as crucial to the process of constant improvement. Each client is urged to provide feedback and to pose further questions prompted by the research publication. The project teams gladly provide free clarification to clients. Frost & Sullivan teams immediately correct report inconsistencies, mistakes, and typographical errors to ensure that reports are up-to-date and accurate.

Frost & Sullivan commissioned its Research Services Group specifically to provide clients with clarification and support for additional research needs. Customers sometimes need information on more market segments—or simply more measurements within a given segment—to fit their specific needs. In these cases, the Research Services Group provides clients with cost estimates. This cost is typically only a fraction of the original research cost.

Continuous Market Research Monitoring

All Frost & Sullivan research publications are living market databases, which means that the company promptly incorporates any new information, corrections, and segmentation strategies. This gives clients the added advantage of always having a reliable source for up-to-date market research. Frost & Sullivan analysts are always available to help clients with any research needs.

Frost & Sullivan constantly monitors all markets on which it performs research. This kind of market vigilance fosters a strong and enduring market research relationship.

Market Engineering
Forecasting Methodology

Overview

One of the most common questions Frost & Sullivan receives from its clients is, "What is your forecasting methodology and how can I assess its level of credibility and accuracy?"

This section on Frost & Sullivan's proprietary Market Engineering forecasting methodology has been added to answer this question.

Frost & Sullivan developed this proprietary system of forecasting because high-technology markets typically do not lend themselves well to statistically based forecasting methodologies.

This methodology integrates several forecasting techniques with the Market Engineering measurement-based system. It relies on the expertise of the analyst team in integrating the critical market elements investigated during the research phase of the project. These elements include:

- Expert-opinion forecasting methodology
- Delphi forecasting methodology
- Integration of market drivers and restraints
- Integration with the market challenges
- Integration of the Market Engineering measurement trends
- Integration of econometric variables
- Integration of customer demographics

The Market Engineering forecasting methodology is a seven-step system that maximizes the credibility and accuracy of the forecasts. The steps in this process are summarized in the accompanying Figure 2-1 and discussed in the following text.

FIGURE 2-1

Total Wireline Card Calling Services Market: Seven-Step Market Engineering Forecast Methodology (U.S.), 2000

Step	Method
1	Market Engineering research process completed
2	Measurements and challenges analyzed over time
3	Identification of market drivers and restraints
4	Expert-opinion integration with analyst team
5	Forecasts calculated
6	Delphi technique integration when needed
7	Quality control within research department

Source: Frost & Sullivan

Market Engineering Research Process Completed

The Market Engineering research process provides the navigational measurements of current market position and trends, which become the basis of the forecast.

Measurements and Challenges Analyzed over Time

Measurements and challenges are analyzed over time to provide more insight into their potential impact on market size and development.

Identification of Market Drivers and Restraints

At this stage, the analyst specifies the factors that will drive the market forward in terms of revenues and determines the elements that will inhibit growth.

Expert-Opinion Integration with Analyst Team

The interview process includes a variety of industry experts: competitors, regulatory officials, and key customers. These expert opinions on the direction of the market are integrated with the data and analysis already created.

Forecasts Calculated

At this stage, analysts collect all the market data needed to create the initial forecast scenarios. Each scenario is tested to determine the most probable outcome for the market size. For example, the forecasts are matched to the leading economic indicators and drivers for each specific industry.

Delphi Technique Integration When Needed

If data and forecast scenarios conflict, it becomes necessary to again discuss the market forecasts with the industry experts interviewed in the research process.

Quality Control Within Research Department

Once the forecasts are integrated into the market section, they are checked by other team members in the industry research group (IRG) and the research director. The forecasts are also checked for mathematical accuracy and internal consistency by the Final Review Preparation Department and the Editing Department.